full time winter and summer. This is one of the reasons why most projects on the Khabur have been failures. The overhead costs are very heavy in relation to the land available.

The Government has an irrigation project partly in operation which will irrigate when completed an area of about 100,000 dunums (25,000 acres). Other projects are under study but their execution will be postponed indefinitely since the Government lacks the necessary capital.

To summarize, it would appear that not only all cultivable lands in Jazirah are already cultivated, but that farmers, in search of lands, have started using marginal lands with insufficient rainfall, and unless the price of cereals keeps at the level of last year there will follow in the coming two years a gradual decrease in the area planted, with heavy losses to individual farmers.

POPULATION OF JAZIRAH

During Turkish rule and up to the French occupation, Jazirah was a wasteland controlled by Bedouin tribes whose submission to the Turkish law was nominal.

I. The Arab Tribes

The tribes, dominated by Shammar, ruled the land and spoiled it, frustrating all attempts at agriculture. They lived on sheep and camel breeding and charged tribute from merchants for protection, each tribe within its boundaries. Moslem and Christian families from Mardin and Nisibin owned lands around what is now Kamishli, Amuda and Dirbassiya, and they traded with the tribes, buying their wool, samneh, and hides and supplying them with their needs and credit. The ownership of land for agriculture seems to have been incidental to the commercial activities of these families.

The tribal boundaries established during the Ottoman rule are still effective. Shammar claims the right of grazing from the Iraqi border at Tal Koshak to Tal Alu and south to Fadghami on the Khabur. There is another small concentration of a Shammar branch around Derbassiya known as Shammar Ezzor.

The neighbor of Shammar to the west is the Tay tribe. Its lands extend from Kubur el Bid and Kamishli south to Tal Brak. The tribe took to agriculture relatively early and in its area are some of the best lands of Jazirah.

452 plantation and the value of his lands. Lands without title have no commercial value though the farmer may use them without opposition. This is apparent at the present time when lands with title and undisputed boundaries sell at ten times the price of occupied lands without title A survey and cadastration of Jazirah lands with a rapid and form settlement of boundary disputed and the grant of property deeds will expand the borrowing capacities of Jazirah enonously and may tend to reduce the exorbitant rates of interest demanded by the money lenders. On such a trable basis, other banking establishments may be induced to open business in the region and relieve its dependance on the greedy money lender.

COMMUNICATION AND TRANSPORTATION

491 During the French Mandate there was not a single paved or as-
496 phalted road in Jazirah. In winter road communications were out between the different towns and villages and the only means of travel was by train which passed through the more important centers of Qamishli, Amuda and Dirbassiya For the rest of the year road transport became possible but expensive because of the absence of roads For this reason, the whole region of Deirik remained undeveloped until quite recently.

I. Roads Within Jazirah

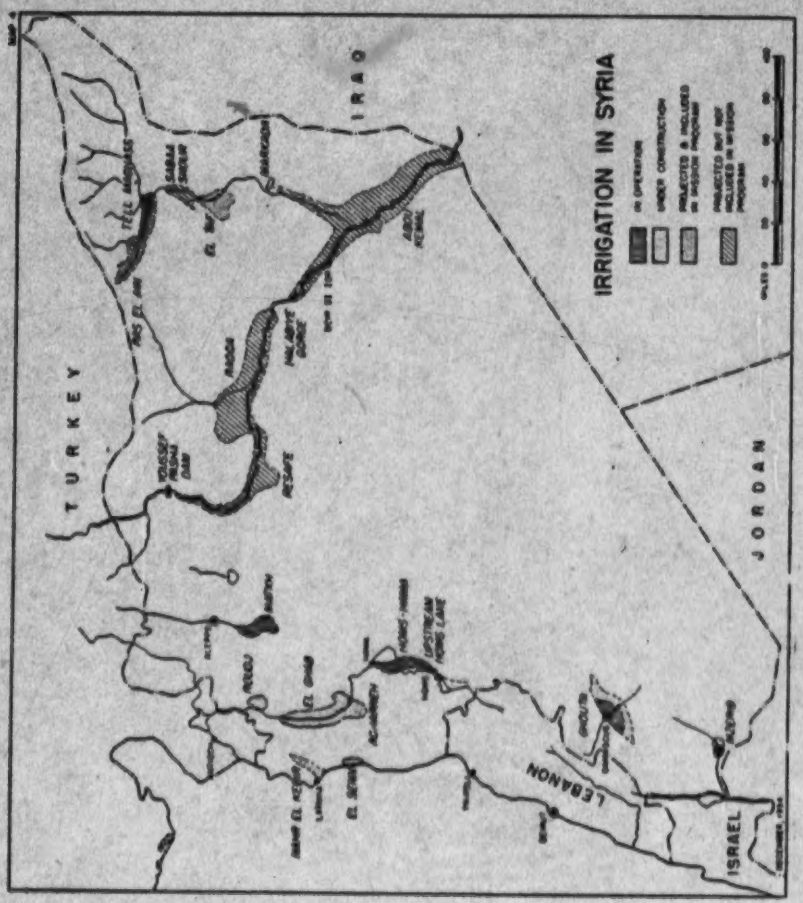
491 The independent Government in Syria started building a
653 road in 1945 between Qamishli and Hassakeh which served at the same time as the arterial road to Aleppo. Though the distance between the two towns is only 85 kilometers, the funds alloted yearly for the road were so small that now, after seven years, only about 30 kilometers are asphalted and the rest is paved The maintenance does not keep up with the deterioration and the road is going to pieces. However, now at last, communication is assured in all weather while before trucks were stuck for days during the rainy season.

Another asphalted road joins Qamishli with Amuda, a distance of 30 kilometers. Here again deterioration is rapid. This road is to be projected another 30 kilometers to Dirbassiya and from there to Ras el Ain, a distance of 60 kilometers.

491 The road Qamishli-Hassakeh is extended for 50 kilometers south to Point 47 on the way to Deir Ezzor. This section is also asphalted.

14:International Bank S-5 (1954) 1955 MD1 Syria MD1

312
453



14:International Bank S-5 (1954)1955 MD1 Syria MD1

312 process of expanding considerably the area irrigated from that river.

Government projects based on the use of river water will have to be the principal means of extending irrigation in the future. Private pump irrigation from rivers or wells cannot be expected to increase rapidly. Additional privately operated pumps could in theory put more land under irrigation, but the land still available for such irrigation would for the most part require higher-lift pumps which are much more expensive to operate. In fact, few new pumps have been installed in the last few years. Moreover, the extension of private pump irrigation on terms which are very burdensome to cultivators appears socially undesirable. Nor is the prospect of expanding irrigation with underground water, particularly through wells, very promising. Underground water in the drier areas of the country is quite limited in supply and often contains harmful sodium and magnesium salts. More extensive investigation of underground water is unquestionably needed, but this should focus in the first instance on finding adequate supplies of drinking water in such areas as the Hauran and Djebel Druze where supplies for human consumption are seriously inadequate and in the Syrian desert where water for livestock is sorely needed. The many wells sunk in certain parts of the country have generally been shallow and have, in one district at least, tended to lower the water table; and the extension of wells to deeper water-bearing strata capable of providing a more plentiful and stable supply may well entail such a heavy investment and high operating costs as to be justified only for crops, such as vegetables, having a high return per hectare.

Completion of Projects Under Way

312 653 Any program must, of course, provide for the completion of government projects already under way. Tell Maghass remains unfinished even though it has been under construction for 10 years, and it is imperative that the remaining part of the canal system be completed rapidly and that the necessary funds—£S 4 million—be provided. The El Senn project, designed to irrigate 5,000 hectares south of Latakia, is over half finished. In the Roudj, a swamp of about 4,000 hectares in Aleppo province, facilities for drainage have just been completed, but an irrigation system must still be planned and laid out. The completion of the latter two projects will require a further expenditure of about £S 4 million.

14:International Bank S-5 (1954) 1955 MD1 Syria MD1

Reclamation of the Ghab[7]

312
653

By far the most ambitious project undertaken by the government is the reclamation of the Ghab. This large marsh, stretching north and south along the borders of Latakia and Aleppo provinces, was created by the Orontes river whose flow has been impeded by the existence of a hard basaltic sill at Kfarie. The plan is to reclaim an area of 35,000 hectares by lowering the sill, deepening the river bed and constructing a network of drainage canals. Two reservoirs to be constructed at Halfaya and Rastane will regulate the flow of the Orontes river and store water sufficient to irrigate not only the Ghab, but also the Acharneh plain—a total area of 65,000 hectares. However, of this area, 22,000 hectares are now irrigated by pump. The permanently submerged part of the Ghab—some 29,000 hectares—belongs in the public domain and will after reclamation be available for distribution among settlers drawn from landless or virtually landless peasants in nearby areas.

The cost of the project was originally estimated at £S 136.5 million including £S 8.5 million for interest during construction, £S 38.2 million for a main road through the Ghab and £S 2.65 million for the construction of a central village. A recent special study sponsored by the International Bank indicates, however, that this estimate will probably have to be increased to about £S 171 million. Because of the numerous works which must be constructed in successive stages, the whole project is unlikely to be completed before 1965. As the drainage works progress, however, new land, totaling 10,000 hectares by 1960, will gradually become available for cultivation. The first stage of the construction work—the lowering of the sill—was begun in the latter part of 1954.

Other Irrigation Projects[8]

In selecting other irrigation projects which might be carried out over the next five or six years, the mission was beset by many difficulties. With one exception, all the projects considered were only in the conceptual stage. Exact data on the areas which might be irrigated by each project, or on the quality of the soils of the irrigable land, were for the most part unavail-

[7] See Annex D, p. 327.
[8] See Annex D, p. 330.

14:International Bank S-5 (1954)1955 MD1 Syria MD1

able. With one exception, detailed planning of the various projects had not been undertaken. 312 653

Nevertheless, the mission believes it necessary to recommend a tentative program subject to alteration upon the completion of more detailed studies. In selecting projects for inclusion in this program the mission has taken into account not only the indicated relationship of cost and benefits, but also the location of the projects and the relative needs of various parts of the country.

1 EUPHRATES VALLEY SCHEME

The Euphrates river undoubtedly offers the greatest possibility of extending the irrigated area in Syria. At present, however, a considerable amount of water is already used for pump irrigation; if much more is to be withdrawn it will be necessary not only to reach an agreement with Iraq regarding the division of the water but also to provide facilities for the storage of water during the flood season. A project for a storage dam at Youssef Pasha has already been worked out; this would increase the minimum flow of the Euphrates during the dry season from about 300 cubic meters per second (m 3/sec) to around 400 m 3/sec. With a long canal starting from the dam it may be possible to irrigate about 185,000 hectares of the so-called Raqqa plateau on the left bank of the river and approximately 54,000 hectares in the Resafe area on the right bank. In addition, the construction of a diversion weir at the Halabiye gorge between Raqqa and Deir ez Zor would probably permit the irrigation of 165,000 hectares farther down in the Euphrates valley. Of the total area thus to be irrigated by projects dependent on the Youssef Pasha dam—404,000 hectares—over one-third or approximately 152,000 hectares are already irrigated by private pumps.

For a number of reasons the mission has reluctantly concluded that this entire group of projects should be deferred until after 1960. First of all, the capital investment required is very large and the benefits will not accrue for a long time. The Youssef Pasha dam itself would cost £S 150 million and the irrigation works would entail an additional outlay of probably £S 560 million. The dam could hardly be completed before 1963, and the construction of all the irrigation works would probably take longer even if it proceeded simultaneously. The financing of the Euphrates and Ghab projects at one and the same time would impose an excessive

14:International Bank S-5 (1954) 1955 MD1 Syria MD1

burden on the resources available to the government; and it would require substantial expenditures over a long period without an attendant increase in production, thus leading to inflationary pressures.

The second reason for deferring the Euphrates projects is the fact that much preparatory work must in any event be undertaken before they can be launched. Estimates of the areas that can feasibly be irrigated must, for example, remain largely conjectural until topographic and soil surveys and land classification can be undertaken. Plans for the irrigation systems should not be drawn up until experiments are carried out to determine the proper irrigation duty (i.e., water to be used per hectare) in the light of soil conditions and projected cropping patterns. While plans for the Youssef Pasha dam have already been drawn up, additional borings to explore the foundation conditions of the dam are still necessary. The mission recommends that all this preparatory work be undertaken over the next few years and it has included £S 3 million in the program for this purpose. Meanwhile the government should also seek to reach an agreement with Iraq regarding the allocation of the Euphrates water.

2 RECOMMENDED PROJECTS

The mission would perhaps be more favorably inclined toward an early start on the Euphrates projects if there were no other possibilities of expanding the irrigated area. But there are a number of small projects which can be undertaken at a lower cost and can be completed more rapidly. After considering the various possibilities, the mission recommends that the following schemes be carried out in the years 1955-60:

Project and location	Estimated cost (in million £S)	Area to be irrigated (in thousand hectares)		
		Total	Newly irrigated	Already irrigated
Mzerib, in the Hauran	8	4.6	4.6	0
Nahr el Kebir, in Latakia	15	4.0	3.5	0.5
Barada, near Damascus	30	15.0	15.0	0
El Taf, on the Khabour	30	ca.20.0	ca.10.0	ca.10.0
Total	83	43.6	33.1	10.5

14:International Bank S-5 (1954)1955 MD1 Syria MD1

The first of these is really an extension of the existing Mzerib project and calls for the irrigation by pump of 4,500 hectares with water from the springs at the headwaters of the Yarmuk. It is the only project ready for immediate execution and has the advantage of extending the irrigated area in a province which suffers from a chronic shortage of water.

The Nahr el Kebir project is included despite its rather high cost because it is a multiple-purpose project with diverse benefits. It involves the construction of a storage dam on the Nahr el Kebir, which will not only serve irrigation but also control periodic floods and supply water and power to the growing port city of Latakia.

The Barada river project entails the construction of two dams—one at Hameh and the other farther upstream near Makaren—to provide water for both power and irrigation. This scheme appears particularly attractive because it would permit the irrigation of 15,000 hectares of good land in the vicinity of Damascus, an area of dense population, and would help to meet the growing power needs of the nation's capital.

The El Taf project requires the construction of an earth fill dam across the Khabour river on the site of an old Roman dam. The water thus diverted might irrigate about 10,000-15,000 hectares on the right bank, and 6,000 hectares on the left bank of El Taf river. The land in this area is rather good but cultivable only if irrigated. While there are other possible projects on the Khabour, the mission considers all of them less promising. Farthest upstream and south of Ras el Ain, some 20,000 hectares could be irrigated, but this is in an area of relatively abundant rainfall where winter crops can be grown without irrigation and where landowners are already installing pumps at their own cost for summer irrigation. The Saba Skour project, 12 kilometers downstream from Hassetche, could irrigate about 15,000 hectares, but the dam which would have to be constructed would flood a considerable area of rich alluvial land now under cultivation. Farther downstream from El Taf, additional irrigation would probably be feasible only if the limited supply of water available in the Khabour during the dry season were supplemented by storage during the flood season. The only possible site for a storage dam appears to be at Markada; but a dam in this location would have to be very long and would provide only a very shallow reservoir with attendant dangers of excessive evaporation and silting. The feasibility of the Markada dam should first be carefully investigated.

If the new projects recommended above are carried out and those now

14:International Bank S-5 (1954) 1955 MD1 Syria MD1

312 under way are completed, Syria would have under irrigation an area of
653 89,100 hectares additional to that already irrigated. Certain projects, including the Ghab, Barada and El Taf, will, of course, not be completed in the period 1955-60 covered by the mission's suggested program. Under that program, the total newly irrigated area will have increased by about 40,000 hectares by the end of 1960.

Planning of Irrigation Schemes

312 The planning, construction, maintenance and operation of all irriga-
653 tion projects (except the Ghab for which a special office has been created)
647 is the responsibility of the Hydraulics Branch of the Ministry of Public Works. At present the staffing of this branch is far from adequate to carry out a greatly expanded program. While the technical staff is supposed to number 78, including 19 engineers, the number actually employed is only 36, of which 11 are engineers. Temporary appointees totalling 23 bridge only part of the gap. The staff must ultimately be greatly expanded. It will take time, however, to train additional technicians; and the goal will never be reached unless the present inadequate salary scale is raised so as to attract competent recruits. Meanwhile, the Ministry will be unable to carry out the suggested irrigation program unless it utilizes every opportunity to delegate the planning and execution of projects to properly qualified private firms.

In discussing the Euphrates projects, the mission has already emphasized the importance of adequate planning and recommended the allocation of £S 3 million for the necessary preparatory work. Part of this sum should be used for the construction of a hydraulics laboratory which would be useful in testing models of all proposed irrigation structures. Through model testing it will be possible properly to design such structures as weirs, canal intakes and sluices so as to anticipate subsequent damage and to achieve maximum economies in construction. It would also be highly desirable to experiment with different types of canal linings. The concrete linings used up to the present are expensive and not wholly satisfactory. It may be possible to use the asphalt available in Syria to devise a lining which would neither crack nor be too fluid and would at the same time be more economical. The mission urges that a qualified foreign firm be engaged to make laboratory tests with this material under conditions simulating those in Syria.

14:International Bank S-5 (1954)1955 MD1 Syria MD1

to do so, and alternative investment opportunities become less attractive, the question of building a railway might well be reviewed.

The mission would be more favorably disposed to a railway if there were no alternative means of reducing the present high transport rates between the Jezireh and Aleppo and Latakia. However, the building of good, all-weather roads, supplemented by the construction of grain storage facilities in the Jezireh, should make it possible to lower transport charges significantly by reducing truck maintenance and depreciation costs and somewhat diminishing seasonal transport peaks. The mission recommends, therefore, that the government undertake this task as a matter of high priority.

To this end the following program should be carried out within the next five or six years:

1. *Improvement and partial realignment of the Aleppo-Latakia road.* The improvement and widening of this road is imperative, and since topographic conditions make widening of certain sections impossible, an entirely new road must be built in part. A new road, for example, will be necessary for a distance of some 30 kilometers west of Jisr ech Chog-hour. Improvement of the section south of Idlib and crossing the Djebel Zâouiye would also be extremely difficult. The mission recommends strongly that this stretch be replaced by a north-south road running through the Roudj. Such a road would not only avoid most of the mountainous terrain but would simultaneously serve the new agricultural district of the Roudj. The cost of the entire project, including the new road construction, is tentatively estimated at £S 7.37 million.

2. *Improvement and widening of the Aleppo-Raqqa road.* This road, 190 kilometers long and part of the trunk highway to the Jezireh, has an asphalt surface only four to five meters wide. In line with recent proposals made by the Syrian government, the mission suggests its widening to six meters, with a two-meter berth on each side. The government has estimated the cost at £S 3.38 million.

3. *Construction of a new road connecting Raqqa with Kamichliye, via Kantari, Tell Tamer and Tloul Mohammed, and continuing from Kamichliye, via Demir Kapu and Deirik, to Ain Divar on the Syrian-Turkish frontier* (total length: 362 km). Unlike earlier proposals, the road we recommend would not follow the present truck route between Raqqa and Km. 47 on the Hassetche-Deir ez Zor road, but would run north of the Djebel Aabd el Aaziz. In this way it would tap a much larger agricultural

14:International Bank S-5 (1954) 1955 MD1 Syria MD1

region, including the dry-farming area south of Ras el Ain and the irrigated area in the Khabour river valley. It would be advisable to start the construction of the Kamichliye-Ain Divar section first, because this rich agricultural region of heavy rainfall is now the most inaccessible part of the Jezireh. To feed the trunk highway the mission also recommends the construction of the following roads: (1) Ras el Ain-Hassetche, crossing the main highway at or near Tell Tamer (73 km); (2) Hassetche-Tloul Mohammed (60 km), thus linking the provincial capital with Kamichliye, the region's commercial center; (3) Derbassiye-main road (30 km); (4) Demir Kapu-Tell Kotchek (30 km); and (5) much farther to the west, Tell Abiad-Kantari (46 km). The first two are considered the more important. In general this proposed road network conforms to the most recently expressed views of the Syrian government, which has tentatively estimated the cost, pending engineering surveys, at about £S 46 million.

North-South Communications

We turn now to a consideration of the other principal transport routes. With respect to the north-south transport axis, improvement of communications between Aleppo and Damascus is most important. A direct standard-gauge railway link between these cities has often been proposed, either by the laying of an additional rail on the narrow-gauge line from Damascus to the junction with the standard-gauge line at Rayak in Lebanon or by the building of a new railway from Damascus to Homs, where it would connect with the DHP line to Aleppo. The mission is convinced, however, that the volume of bulk goods suitable for rail transport moving between Aleppo and Damascus is far too small to justify the large investment required, at least £S 18 million for the former and £S 36 million for the latter project. The solution is rather to improve and widen the Aleppo-Damascus road. The section between Hama and Aleppo urgently demands improvement, and the entire road should be widened by at least one meter to permit easier flow of two-way vehicular traffic. The cost of widening would probably be about £S 10,000 per kilometer or a total of about £S 4 million.

The transport route south from Damascus to Dera'a and the Jordanian frontier is served both by road and the Hedjaz Railway. The problems of the latter have already been discussed. The road, although not as well

14:International Bank S-5 (1954) 1955 MD1 Syria MD1

Urban Social Welfare

368 It seems desirable in the near future to inaugurate some social welfare work in the urban areas as a counterpart of the proposed community work in the rural areas. Initially this will have to be on a modest and experimental scale. We suggest that over the next six years 8 to 10 centers be established to serve as focal points for voluntary community activities. About £S 350,000 might be allocated for investment in such centers, and £S 120,000 for operating expenditures. The centers would provide facilities for reading, radio listening, community meetings, adult education courses and eventually even for community baths. It would be advisable to combine the community hall as far as possible with the traditional school building; we therefore recommend that all new schools be constructed as all-purpose buildings which can serve children during the day and adults at night. The centers might well be put in the charge of selected teachers who would receive some special training in social work.

We would stress particularly that this modest program is experimental in character. Experience with the first centers will demonstrate how useful they can be, what needs they must serve and how they can best meet these needs.

Public Buildings[37]

653 361 Public buildings are, of course, prominent features in most settlements of any size. They must be properly planned and fitted into town planning schemes so that they will be of maximum service to the government and the community. Elsewhere in this report we have discussed building requirements for agriculture, education, health and similiar special purposes. Any development program should also take into account the probable outlays on buildings of a general administrative character. The mission, however, had very little basis on which to project investment expenditures on government buildings of this kind. During the period 1949-53 the Ministry of Public Works spent on an average about £S 1 million on the construction of public buildings for purposes other than agriculture, education and health. The mission thought it advisable to assume that such expenditures would rise in the future and has accord-

[37] See Annex I, p. 472.

14:International Bank S-5 (1954)1955 MD1 Syria MD1

ingly allowed for construction amounting to £S 8.5 million during the years 1955-60, or a little over £S 1.4 million annually.

The mission has one general observation to make regarding the responsibility for planning and constructing government buildings of all types. We believe that the Ministry of Public Works should in the future, as in the past, be responsible for designing and constructing public buildings. On the other hand, the various ministries and government agencies for which the buildings are to be built should be in the position of programming their own requirements. We have already had occasion to stress this in connection with public health facilities but it applies generally. Each ministry or independent government agency which requires a more or less continuous building program should have at least one or two officers charged with the task of anticipating building requirements. Proposals for new construction and appropriate budget allocations should come from the ministries concerned. Once they are approved, it is the task of the Ministry of Public Works to design and construct the building. Final approval of the design should also rest with the initiating ministries or agencies since only they will be able to judge whether the proposed design meets their needs.

A Housing and Settlements Administration

In this and previous chapters we have envisaged that the government will play an increasingly prominent role with respect to the establishment of new rural settlements, urban housing and town planning. These are in the main new functions for the Syrian government and at present it is hardly equipped to discharge them. A new organization with a specially trained staff will be necessary. An independent agency set up for this purpose would have the task of (1) providing technical assistance to municipalities in town planning and related fields, and (2) planning and coordinating the work in housing and settlement.

The planning must be on two levels: on a broad national and regional scale, keeping in mind population trends and the interaction between economic development and the geographic distribution of population, and on a more detailed local scale, involving particular settlement projects.

Regarding the first of these planning functions, we do not suggest that the agency should be charged with drawing up the economic development program. It must keep under constant study, however, the impact which

14:International Bank S-5 (1954)1955 MD1 Syria MD1

ANNEX D *NOTES ON IRRIGATION*

1 THE GHAB PROJECT

312
453
185

The Ghab valley, part of the Orontes river valley, is about 50 kilometers long from south to north and about 10 kilometers wide. There is in the valley a marshy area of about 35,000 hectares, which cannot be cultivated at present, although it consists mostly of good alluvial soil. If drained and irrigated the reclaimed land would probably be suitable for rice, cotton, sugar beet and pulses as summer crops, and wheat, barley and winter vetch or clover during the winter. It has the great advantage of being near both the important domestic market of Aleppo and the port of Latakia, permitting ready export of products in excess of local needs.

The marsh would be drained by excavation of a basaltic sill at Kfeir that now prevents the out-flow of water, and by construction of a system of drainage canals. Included in the area to be developed for agricultural use is the Acharneh plain just upstream from the Ghab valley in a bend of the Orontes. The Orontes river is now unable to drain the plain because its bed has been raised by silting. An extensive network of irrigation canals would be constructed for the irrigation of the plain and the valley. Including the reclaimed land, the total irrigated area would be about 65,000 hectares. A reservoir with a storage capacity of about 68 million cubic meters would be constructed behind a dam near Halfaya to control the Orontes flood, and a second dam located near Rastane would provide a reservoir of about 180-265 million cubic meters for irrigation purposes. About 20,000 KW of electric power would eventually be developed in hydroelectric plants at Rastane, Maharda and Jisr ech Choghour. The last two plants, however, could be operated only during the off-season for irrigation.

Of the 65,000 hectares, 43,000 have not previously been irrigated and of these 29,000 hectares are government-owned. The project would further provide for the settlement of a large number of farmers in the latter area.

It is anticipated that completion of the entire project will require about 10 years, proceeding in overlapping stages as follows: (a) drainage of the Orontes valley; (b) the Halfaya flood control dam; (c) a part of the road system; (d) a soil improvement program; (e) about 75% of the irrigation

14:International Bank S-5 (1954) 1955 MD1 Syria MD1

312 network. If an early start is made on (a), (b) and (c), then the soil im-
653 provement program and irrigation network might be initiated in 1956 and
185 1957 respectively.

The later work, mainly in the Acharneh plain, will be done after 1960. It will include drainage of the plain, construction of the Halfaya tunnels, completion of the road system, construction of the irrigation network of the Acharneh plain and Rastane dam, and the relocation of the Amir Ghajar hydro plant. The entire project could be completed by the end of 1963.

In the Ghab area, 41,680 hectares will be irrigated by a system of three main canals, one on each bank of the Orontes, branching from an intake to be constructed near Acharneh, and a third, made from the present bed of the Orontes, originating five kilometers downstream near Ammourine from an intake built in the new Orontes. This will irrigate the lands between the river and the two other main canals. The total area brought under irrigation in the Ghab, taking into account the 13,600 hectares now under partial irrigation, will not exceed 28,000 hectares until about 1963. If temporary limitations on summer irrigation are to be avoided, the work will have to proceed according to a closely coordinated schedule.

Cost

The preliminary cost estimate made in 1952 and later brought up to date at the request of the International Bank forms the basis of the following estimate, which includes engineering and supervision expenses, and which assumes that the major proposed technical revisions of the provisional plans will be adopted. On this basis the total cost of the full program is estimated at £S 130.85 million, exclusive of the cost of local and national roads, or £S 169.85 if these are included.[1] The foreign exchange requirement would be about one-third of these totals. During the term of the mission's program (to December 1960) disbursements are likely to be £S 84.25 million without roads or £S 110.25 million if roads are included. Additional funds required for indirect consequences of the project have not been included in the costs for the main project.

[1] All figures are exclusive of any margin for contingencies.

14:International Bank S-5(1954)1955 MD1 Syria MD1

Economic Benefits

The mission estimates that the gross value of the produce of the Ghab area will be in the neighborhood of £S 63 million annually, or about £S 47 million after deducting the amount already produced in the area in question. The production of cotton, maize, sorghum, rice and sugar beets is particularly likely to have a marked impact on Syria's balance of trade. It may be assumed that the output of cotton and cottonseed will in effect be added to the country's exportable surplus; the additional rice production may make Syria fully self-sufficient in that commodity; and the sugar beet production should permit a considerable import saving.

In addition to the project's contribution to an increase in national income and an improvement in the balance of payments, the settlement of farmers in the area made possible by the project will assist in relieving the present population pressure in the province of Latakia and particularly in the Alaouit mountains. In Latakia, for example, the amount of cultivated land available per person is less than 50% of the average for Syria as a whole. Settlers in the Ghab will be able to earn substantially more than the bare living they have been able to eke from the soil in the past.

Organization

The "Administrative Office of the Drainage and Irrigation Works of the Ghab Lands" was created in 1951, to be attached to the Ministry of Public Works until the technical work is completed. It will be responsible for the design of the works, award of contracts, supervision of construction, payment of expenses and for sale of the land. As parts of the project are completed, the Office will take care of the operation and maintenance of the dams and of the irrigation and drainage networks and will collect water charges. During the planning and construction period the Office should recruit and train staff to carry out the continuing operation and management of the project.

It is important that the policy, and the attendant operating and budget delegations, provide for the establishment and operation of the agricultural research centers and for a long-range educational and farm demonstration program; otherwise, it will be practically impossible to achieve acceptable land use in the area.

14:International Bank S-5 (1954) 1955 MD1 Syria MD1

II PROJECTED SCHEMES

185 312 653 The Youssef Pasha project is the most important of those under consideration, but it is still at the planning stage. No decision has been taken with regard to the irrigation of the Euphrates valley as a whole.

Euphrates Valley—Youssef Pasha Dam[2]

In Syria the long narrow Euphrates valley stretches generally northwest to southeast from Djerablous at the Turkish border to Abou Kemal at the Iraqi border. It is about 450 kilometers long; its average width is about 7.5 kilometers, its maximum 16.

The soils of the valley proper are mainly alluvial, varying from silt to sandy loam and clay. With irrigation, they would be suitable for cotton, rice, sugar beet, peanuts, sorghum, etc. as summer crops, and wheat, barley and winter legumes as the main winter crops.

Irrigation of the whole Euphrates valley, on the assumption that about 85% of the land can be cultivated, would require about 170 cubic meters per second, more than can be assumed to be Syria's share of the natural flow of the Euphrates. Irrigation could probably profitably be extended to an additional area of about 130,000 hectares on the left bank in the vicinity of Raqqa. All in all, a total supply of about 226 cubic meters per second would be needed, about 75% of the maximum of 300 cubic meters per second utilizable for irrigation from the river's natural flow, which would leave only 25% for Iraq. For this reason, and because of the power potential, it was thought desirable to construct a storage dam on the Euphrates; Youssef Pasha was selected as the site. British engineering consultants recommended a concrete dam of the pierced type, 650 meters long with 52 sluice gates, and a power plant capable of producing about 45,000 KW of firm power or a yearly output of about 400 million KWH, plus about 120 million KWH of secondary power.

The consultant firm originally estimated the project cost, including a transmission line to Aleppo, at about £S 114 million; a revaluation made in 1953 raised the estimate to £S 150 million. The capacity of the reservoir behind the dam would increase the flow of the river utilizable for irriga-

[2] Since studies of the valley have not advanced to the point of a draft project, the figures which follow are only indications of the order of magnitude of possible development.

14:International Bank S-5 (1954)1955 MD1 Syria MD1

tion by about 100 cubic meters per second; this, added to Syria's assumed share of the natural flow, would provide sufficient water to irrigate the valley, including the area on the left bank.

Until recently it was thought that the length of head canal needed to connect Youssef Pasha with the irrigable areas would, because of difficult topography, preclude construction of an economic gravity irrigation system. The mission, taking account of experts' reports, has the following comments:

About 48,000 hectares on the river's right bank, between Youssef Pasha and Halabiye gorge, could be irrigated by pumping, at a cost of about £S 50 million; but this would not be an economic method of irrigating the fertile Ressafe plain. Both the valley and about 6,000 hectares of the plain could be irrigated by constructing a gravity canal branching from Youssef Pasha, at a cost of about £S 100 million. Whether it is worthwhile to spend an additional £S 50 million to irrigate a portion of the plain is a question to be considered.

On the left bank, however, a gravity canal branching from the Euphrates at the foot of Youssef Pasha dam could reach the plateau west of Raqqa, 100,000 hectares of which are now without any possibility of being irrigated, and could provide wide-scale irrigation between Ressafe and Halabiye gorge. About 185,000 hectares of excellent soils could be irrigated, about 155,000 by gravity flow and about 30,000 by pumping from the canal.

The possibilities of such a project should be investigated. We have made provision for such a study in our allocation for Euphrates valley studies; the aerial survey and mapping of the area are allowed for elsewhere. The gravity irrigation portion should cost roughly £S 266 million, of which £S 150 million (55%) represents the cost of the head canal. The pumping facilities would cost about £S 34 million. The construction cost of the project would thus be about £S 1,700 per hectare, less than that of the Ghab project.

Halabiye Project

Halabiye gorge offers an excellent site for a diversion weir: inundations would be restricted to the gorge itself. The weir could feed two irrigation canals, one on each bank of the Euphrates, extending 250 kilometers to Abou Kemal near the Iraqi border, and these could supply gravity irriga-

14:International Bank S-5 (1954) 1955 MD1 Syria MD1

tion to about 165,000 hectares, leaving about 50,000 to be irrigated by pumps.

The cost of such a project would be about £S 165 million, or £S 1,000 per irrigated hectare. But although it would irrigate the fertile Meyadine area and foster development of the Abou Kemal locality, we do not recommend its construction during the next five years. Halabiye is rather far down the Syrian Euphrates valley; much of the area is already under pump irrigation; and for the limited capital expendable the Youssef Pasha site offers wider potentialities, particularly in the generation of hydroelectric power for the Aleppo area.

Khabour Valley

The Khabour valley has possibilities for projects in addition to the Tell Maghass scheme. None has been fully investigated. The soils are generally of good quality, ranging from loamy sand to medium clay, suitable for cultivation of cotton, rice, peanuts and (in the northern parts) sugar-beet. All summer crops must be fully irrigated, and although rainfall is more plentiful here than in many parts of Syria, partial irrigation of winter crops is advisable in some areas.

A diversion weir could be constructed across the Khabour downstream from Ras el Ain to feed an irrigation canal on each bank. Areas of 13,300 and 7,400 hectares, on the right and left banks, respectively, could be irrigated. Rainfall in this area is adequate for winter crops and several large estate owners have installed pumps for summer cultivation.

A canal could be excavated on the right bank of the river, from Tell Maghass, but no more than 3,800 hectares would be irrigated; moreover, the soil is not very good, being sometimes excessively salted with gypsum.

About 12 kilometers downstream from Hassetche a dam could be built on the site of the ruined Roman dam of Saba Skour. Although this would permit the irrigation of about 15,000 hectares, it would unfortunately reflood the site of the previous reservoir whose fertile alluvium is now under cultivation.[3]

Sixteen kilometers downstream from Saba Skour another ruined Roman dam formerly supplied two large canals, one on each bank of the Taf river, a tributary of the Khabour. Here could be built an earth-fill dam,

[3] The area of this site is difficult to determine owing to the flatness of the surrounding country.

14:International Bank S-5(1954)1955 MD1 Syria MD1

about 760 meters long and 15 meters high, to feed a 14-kilometer canal on the right bank, irrigating about 8,000 hectares (a longer canal might irrigate 10,000-15,000 hectares) and a shorter left-bank canal, irrigating about 6,000 hectares. The soil is fairly good, and the mission considers this the best project that could be started in the Khabour area. A rough cost estimate is about £S 30 million, or £S 1,500 to £S 2,000 per hectare, depending on the area irrigated.

All told, these projects would irrigate 62,000-69,000 hectares, including the 8,500 now irrigated by the left bank canal of Tell Maghass. With a duty[4] of 0.6 liters per hectare per second, about 40 cubic meters per second would be needed. Since that is the total discharge of the Khabour utilizable for irrigation, no water would remain for dry season cultivation downstream from the Taf. Accordingly, consideration has been given to storage of the Khabour flood. The downstream portion of the valley is very flat, with the exception of the right bank where it is bordered by an eroded plateau. The plateau is nearest to the river at Markada, and here a dam could be built to form a reservoir. About 800 million cubic meters could be stored behind a dam about 20 meters high; even after loss through evaporation from the large surface area, about 700 million cubic meters would remain, or about 45 cubic meters per second for a six-month irrigation season. This discharge could irrigate about 75,000 hectares out of a possible 250,000 along both banks. The sandy and loamy alluvial soils of this area would be suitable, under irrigation, for the cultivation of rice, cotton, peanuts, pulses, sorghum and maize.

The site's disadvantage is that the gentle slope of the left bank would require construction of a long levee, although there is an easy abutment for the dam on the right bank. Moreover, because the height of the dam would necessarily mean a very shallow reservoir, it would be difficult to prevent siltation. In the circumstances, the government has made no study, survey or cost estimate of the project. The mission recommends that aerial and ground surveys and mapping be undertaken to determine whether the site is satisfactory or whether an alternative must be found. As a first step, the ground survey should be limited to five or six profiles in the area contemplated for the reservoir. This should take about three days, at a cost not in excess of £S 1,000, to be charged to the study of the Euphrates valley, where most of the stored water would be utilized.

[4] The average quantity of irrigation water which must be applied annually to the land to bring the crops to maturity.

14:International Bank S-5 (1954) 1955 MD1 Syria MD1

Upper Orontes Valley

312 653 185 In the area of Homs two projects are under consideration to expand cultivation in the upper Orontes valley, where cotton and sugar beet can be grown as summer crops and wheat, barley and clover as winter crops: a canal branching from Homs Lake to irrigate about 3,000 hectares on the left bank of the Orontes, and one branching from a diversion weir to be constructed about 23 kilometers upstream of the south end of Homs Lake. Here the dry season flow of the Orontes is at least 10 cubic meters per second, sufficient to irrigate about 15,000 hectares on the right bank, so that the Ghab project would not be adversely affected. However, the Orontes rises in Lebanon, where a project to irrigate the Kaa area is being considered. This would reduce the available flow at the Syrian border, correspondingly reducing the irrigable area in Syria. Since the project is estimated to cost about £S 15 million, an agreement with Lebanon on the partition of the Orontes should be concluded first. We also recommend a more accurate geological survey of the Rastane reservoir area, to ascertain whether potential capacity has been overestimated. Meantime, the two projects should be deferred.

Barada Valley

Consideration has been given to regulating the flow of the Barada river, to increase the irrigated area of the Ghouta in the vicinity of Damascus where soils toward the valley bottoms are suitable for the growing of vegetables.

Two dams across the Barada river at Hameh and near Makaren, each about 50 meters high, would provide a total storage capacity of about 180 million cubic meters, thus increasing the utilizable irrigation flow from 7 to about 15 cubic meters per second and permitting dry season irrigation of about 15,000 hectares of new fertile land in the vicinity of Damascus. A hydroelectric power plant could be built at the foot of each dam to develop a total power of about 10,000 KW.[8]

Surveys and studies have not progressed to the point of a draft project. A rough cost estimate is about £S 10 million for each dam, plus not more than £S 10 million for the development of the canal system, making a total

[8] These are recommended in Annex G.

14:International Bank S-5 (1954)1955 1.iD1 Syria MD1

of about £S 30 million for the project (exclusive of the hydroelectric plants), or about £S 2,000 per hectare. The mission recommends that studies of the two sites be completed and that construction of the dams and hydro plants begin as soon as possible.

Yarmuk Valley

Cultivation on the alluvial and sometimes very fertile soils[6] of the Mzerib area irrigated from the upper springs of the Yarmuk river could be extended by pumping water to a new area of 4,500 hectares. This second phase of the Mzerib irrigation project has been fully investigated and is ready to be started; the first phase is already in operation. The pumps would be driven by diesel motors unless and until it is decided to build a hydroelectric power plant on the Yarmuk. The cost is estimated at about £S 7 million, approximately £S 1,500 per hectare. In view of the interest in developing irrigation in the Hauran mohafazat, which is in general not well provided with water, the mission recommends that this project be started without delay.

Nahr el Kebir Valley

The Nahr el Kebir, a short river flowing from the mountains bordering on Turkey, empties into the Mediterranean in the vicinity of Latakia. It has heavy floods, but in dry season the flow is no more than 0.5 to 0.6 cubic meters per second. A regulated flow would permit irrigation of about 4,000 hectares in the vicinity of Latakia for vegetable growing, thus making a significant contribution to the general development expected with the improvement of the port.

The construction of a dam of about 60 meters is projected, with sufficient capacity to permit flood control, irrigation, power and water for the port of Latakia. Site surveys are already under way. Additional cost studies must be made, but the cost will probably be of the order of £S 15 million. Although this is rather expensive for a single project, the mission feels that in view of its multi-purpose nature and the great importance of the development of the port of Latakia, studies should promptly be completed and the project constructed during the next five years.

[6] Suitable for cotton, with peanuts and citrus on the lighter soils.

14:International Bank S-5 (1954) 1955 MD1 Syria MD1

312 653 185 *The Mission's Program*

The new irrigation projects recommended by the mission, together with those under way, call for a total expenditure of £S 193 million over the next five years, to which must be added £S 3 million for maintenance and £S 1.2 million for research and demonstration, giving a grand total of £S 197.2 million. Table 1 shows the allocations among projects, together with an indication of the areas to be irrigated. Appendix Table II sets forth the irrigation schemes.

TABLE 1 Mission's Proposed Irrigation Program, 1955-60

Irrigated area			Projects	Functions	Total	Already spent	To be spent in the program
New area	Already irrigated	Total					
43.0	22.0	65.0	El Ghab	D + GI	103[a]	1	102
0	0	0	Euphrates valley studies		3	—	3
4.5	4.0	8.5	Tell Magham (LB)	GI	12	10	2
4.0	0.5	4.5	Roudj	D + GI	5	2	3
4.5	0.5	5.0	El Senn	GI + PI	3	2	1
4.6	0	4.6	Muzrib	PI	7	0	7
10.0	10.0	20.0	El Taf	GI	30	0	30
15.0	0	15.0	Banda	HEP + GI	30	0	30
3.5	0.5	4.0	Nahr el Kebir	HEP + GI	15	0	15
89.1	37.5	126.6			208	15	193

Key: GI – Gravity Irrigation; HEP – Hydroelectric Power; LB – Left Bank; PI – Pumping Irrigation; FC – Flood Control; D – Drainage; R – Regulation

[a] Including £8.47 million to be spent in a later program.

NOTE: Area figures in thousand hectares; expenditure figure in million £S.

185 312 242 III PLANNING

There are two stages of planning for irrigation projects. The first, the agricultural phase, entails a preliminary study of the soils and the computation of water duties. The technical phase includes planning of the civil engineering works necessary to divert, convey and distribute the water in the selected area. In the Main Report the mission has discussed the second

14:International Bank S-5 (1954)1955 MD1 Syria MD1

The low fee for the Makt project is justified by the restricted nature of the facilities provided, but the fees assessed for the Tell Maghass, Mzerib and Senn projects appear low in proportion to the money value of the benefits to the landowners or cultivators, and are considerably less than the cost of pumping irrigation provided by private owners. Accordingly, we have recommended review of these fees.

APPENDIX

TABLE II Irrigation Schemes Under Construction or Projected

Irrigated area (thousand hectares)			Location	Functions	Expenditures (million £S)		
New area	Already irrigated	Total			Already spent	To be spent	Total
43.0	22.0	65.0	El Ghab	D + GI	1	170	171[a]
252.0	152.0	404.0	Youssef Pasha		—	150	150
140.0	45.0	185.0	Raqqa Plateau	GI + PI	—	300	300
85.0	80.0	165.0	Halabiye	GI	—	160	160
27.0	27.0	54.0	Resafe	GI or PI	—	100	100
4.0	0.5	4.5	Roudj	D + GI	2	3	5
4.6	2.2	6.8	Mzerib	GI + PI	2	7	9
15.6	5.1	20.7	Ras el Ain	GI	—	30	30
4.5	4.0	8.5	Tell Maghass (LB)	GI	10	2	12
2.8	1.0	3.8	Tell Maghass (RB)	GI	—	6	6
8.0	7.2	15.2	Saba Skour	GI	—	25	25
10.0	10.0	20.0	El Taf	GI	—	30	30
53.0	22.0	75.0	Markada	GI	—	100	100
8.0	7.0	15.0	Upstream Homs Lake	GI	—	15	15
3.0	—	3.0	Homs Lake (LB)	GI	—	3	3
4.5	0.5	5.0	El Senn	GI + PI	2	2	4
3.5	0.5	4.0	Nahr el Kebir	HEP + GI	—	15	15
15.0	—	15.0	Banda	HEP + GI	—	30	30
431.5	235.0	665.5			17	1,148	1,165

Key: GI – Gravity Irrigation; PI – Pumping Irrigation; D – Drainage; HEP – Hydroelectric Power; FC – Flood Control; R – Regulation; RB – Right Bank; LB – Left Bank

[a] Including local and national roads.

NOTE: The figures given above are only rough estimates. Accurate figures are not available because most of these irrigation schemes have not yet reached the draft stage. The purpose of this Table is to give an idea of the order of magnitude of the investment, extending beyond the scope of the mission's program, to be made for the development of irrigation in Syria.

14:International Bank S-5 (1954)1955 MD1 Syria MD1

for the asphalted roads, and allowing £S 500 per kilometer for the macadamized routes and lesser amounts for others, the annual road maintenance budget should actually be around £S 6 million to £S 7 million.

This raises the question whether Syria should consider new road investment if existing ones cannot be properly maintained. For every kilometer of new construction the annual burden of upkeep increases. But current deficiencies in road maintenance are not simply a matter of money; the present annual expenditures are sufficient to keep the roads in far better condition than they are. The causes of neglect include several other factors.

Personnel

Some earlier studies[8] have referred to seasonal labor shortages in road maintenance. On this there are differences of opinion. In general, local authorities do not find difficulty on this score, although without question there are shortages of supervisory personnel in the middle rank and foreman grades. A more serious situation is evident at the engineering level, where a wider use of foreign consulting firms and contractors would be helpful. For the whole range of public works, including roads, the government has available about 50 qualified engineers. The detailed knowledge and skill of intensive specialization is difficult to achieve under these circumstances and the mission was therefore not surprised to observe occasional use of overheated asphalt, or of too chalky a sand in mending mixtures. The effectiveness of the small corps of engineers is further reduced by the inordinate burden of paper work and administrative detail, if not by an actual preference of many for office work at the expense of practical field supervision.

Organization

Road maintenance, as a responsibility of the Secretary-General of the Ministry of Public Works, must compete for attention with all other types of public work activities and often fares poorly. This organizational problem may be partially responsible for a certain maldistribution of maintenance funds among the various districts, which often leaves a number of

[8] E.g., Sir Alexander Gibb & Partners, *The Economic Development of Syria*, 1947.

14:International Bank S-5(1954)1955 MD1 Syria MD1

districts without the resources necessary for the most ordinary upkeep.

A wider use of road gangs would achieve far better maintenance, for the same expenditure, than is possible with the prevailing "one-man" system. A team concentrating upon a section at a time can often effect repairs which one man alone cannot do at all; gangs also permit closer technical supervision and more efficient use of equipment—valuable considerations when the supply of both is limited.

Road Maintenance Equipment

The country as a whole has far too little road-building and maintenance machinery for effective work. Mechanization must of course be introduced gradually where so much of the work is now done by hand. The present stock of equipment cannot meet even current needs. Half the mixers in the Damascus area are unusable, for example. There are no graders or bulldozers for maintenance purposes, although at least ten are needed for the tracks alone.

It is not enough to expect that construction machinery will be assigned to maintenance afterward; much of it will be worn out on the contemplated road-building program. Maintenance machinery should be bought separately. For one or more stone-crushing plants, the necessary bulldozers and graders, new rollers and other equipment needed currently, the mission foresees an expenditure of £S 1 million in the first five-year period and twice this amount in the second five years.

D LEGISLATION ON THE USE OF ROADS

Traffic Laws

Syria enacted a modern, comprehensive traffic code in 1953, which contains the usual detailed regulations on vehicle dimensions, maximum wheel loading, weight limits for certain types of roads and bridges, and similiar provisions for protection of the roads. It also provides for periodic inspection of vehicles for mechanical fitness. Rules of the road for safe and courteous driving are prescribed, as well as the knowledge required for obtaining a driver's permit.

The code is essentially a good one, and it is regrettable that most of its provisions are ineffective because of poor enforcement. Apart from the danger to human life, unless better measures are taken to enforce the

14:International Bank S-5 (1954) 1955 MD1 Syria MD1

861 trees and not built upon. Possibly in this way the broad, deserted unpaved streets, swept by the winter winds and burning under the summer sun, can be transformed into long garden avenues without any heavy expenditure by the local authorities.

VI PUBLIC BUILDINGS

658

Direction of Investment

Out of a total of about £S 25 million expended on public buildings between 1948 and 1954, £S 9 million was for public health structures while more than £S 7.5 million was invested in schools and a like sum on administrative buildings.[7]

The proportion spent for administrative buildings has been high and is attributable to the organizational needs of the newly independent country. We have assumed that the rate of construction of such buildings is likely to increase, but we suggest that no more than £S 750,000 be expended during 1955-56 while a critical survey of the most urgent requirements in this category is being prepared. In 1957 the expenditure may reach £S 1 million, rising to £S 2.5 million in 1960 and making a total of £S 8.5 million over the six years. The resulting average of £S 1.417 million would in fact be about 50% higher than the average of recent years.

The total expenditure for public buildings, including schools, public health buildings and other types, is likely to average £S 7 million annually, assuming that the municipalities and other authorities share the cost of schools. Compared with the effort of the past few years, which was at a level of £S 4.5 million a year, this would be an increase of about 60% to 70% per year.

Policy

In the Main Report the mission has recommended that in future the Ministry of Public Works be responsible for design and construction of all public buildings, relying on each government agency to specify and draw up its own special requirements. It may be necessary, especially at the beginning of the program, to engage a private firm of Syrian or foreign

[7] Including buildings for the judicial and security services.

14:International Bank S-5 (1954)1955 MD1 Syria MD1

architects to design certain major projects independently or in collaboration with the Ministry of Public Works. A number of standard types of buildings should be developed and studied as a guide for future projects. For example, two or three tested types of classrooms should be available, suited to the differing climatic regions of Syria.

Commercial Buildings

With respect to commercial buildings, the government's problems include provision of town and village markets. For centuries these have been built on a traditional oriental design, with a network of covered passages on which the various shops open. Such construction has permitted market activity under conditions of severe heat or heavy rain, and has lent itself to the prevalence of small shops appropriate to the country's economic standards. Although this form of market is still the most common, new ones of the type are no longer being built. In some settlements of the Jezireh, in Kamichliye and Hassetche, the new *souks* borrow something from the old design, combining it with regular narrow streets covered with temporary roofing. Elsewhere markets are following the western pattern.

As part of the general development program the government might well finance a special study of the type of market that will most economically offer protected shopping, small-size shops, sanitary conditions and better ventilation. Thereafter municipalities should proceed to plan for their own requirements.

Transportation Structures

Most buildings related to transportation services are the responsibility of the railways and port authorities, and provision has been made for them in the transport program. Yet one category of building usually neglected in planning is that serving bus and truck transportation, which is of greatest importance in a country like Syria with its many small settlements. What is needed is something equivalent to the caravanserai of earlier times—perhaps a combination of a big courtyard, a service garage, a storehouse and a small hostel. Here too, the government might undertake a study of an appropriate prototype, leaving construction to the municipalities and private business.

14:International Bank S-5 (1954) 1955 MD1 Syria MD1

Miscellaneous Buildings

653 [341] There are, of course, various other types of public and special-purpose buildings with which the government is concerned. Among these are agricultural structures, workshops, museums, monuments and resthouses, to whatever extent they are not privately financed. The mission has made suitable allowances for these in the six-year program, under the appropriate headings elsewhere in this report.

[341] Although they are financed and constructed entirely by private endeavor, the religious buildings deserve special mention. This is a field in which Syria excels. Some of the mosques, minarets and churches, whether in large towns or small villages, are outstanding illustrations of the way in which architectural design and construction can be adapted to the needs of the people, their economic resources, and the materials and skills available locally.

657 VII COST OF PROPOSED SETTLEMENTS AND SOCIAL SERVICES PROGRAM

Table 5 summarizes the mission's proposed six-year program in the field of settlements and social services.

TABLE 5 Proposed Six-Year Program for Settlements and Social Services Financed by the Public Sector (*Thousand £S*)

Sector	Total	Annual average
Housing	28,076	4,679
Education	271,780	45,297
Public health	74,150	12,358
Social welfare	450	75
Community development	2,687	448
Buildings for other purposes	8,500	1,417
Community services	86,000	14,333
Planning—Administration	3,600	600
Total	475,243	79,207
Share of		
Central government	372,643	62,107
Municipalities	102,600	17,100

29:Dunn S-4 (1952)1952 MI Middle East
Syria MDI

is a very high figure, representing more than 50 per cent of the total land under cultivation, and the United States Agricultural Attache is inclined to believe that the Ministry's figures include the total area served by irrigation systems, whether or not all the land receives water each year.

There are no large-scale irrigation works in Syria. State and local governments have constructed and now maintain a number of small dams, diversions, and canals, but the total area served by these public works in 1951 was only 100,000 acres. Several other projects, scheduled for completion within the next three or four years, will increase the area under public works another 100,000 acres. Most of these projects are being financed by the federal government out of its regular budget.

By far the largest area is served by small diversions operated by individuals. The next largest and fastest growing area under irrigation is that served by mechanical pumps. The number of pumps doubled from 1950 to 1951 and the area irrigated increased three times. These pumps are used mostly for drawing water from streams.

In the absence of detailed surveys, accurate estimates as to how much water might be available from all sources are impossible to obtain. Draining the Ghab Swamps on the Orontes River west of Aleppo to bring another 100,000 acres into cultivation is now being studied by a Dutch engineering firm, and a large dam on the Euphrates River to impound water in sufficient volume to serve an additional 750,000 acres is under consideration. Several million acres of land along the Euphrates River probably are suitable for cultivation from the standpoint of soil if water becomes available. At the present time irrigation along the Euphrates is limited to the low-lying land between the banks of the river. Through the centuries the river has cut a bed from a half mile to as much as 10 miles wide through the plain, which is now 30 to 50 feet above the water level. It has proved too expensive for individuals to use pumps to pull the water from the river for irrigation.

The same general condition prevails on the main tributary of the Euphrates, the Kabur. Numerous pumps have been installed along the Kabur, and a gravity system in the north, operated by a small dam and canals, is being extended under a current program. It is possible the water would be adequate to extend the gravity system slightly in the southern reaches of the river.

Water might be diverted also from the Tigris River which runs across the northeastern border of Syria. Extensive use of water from any of these international rivers, however, very likely would involve agreements with neighboring countries. Additional water might be provided also by the other rivers in the country. All of these proposals involve tremendously expensive projects beyond the means of the country to finance without outside help.

CAPITAL AND CREDIT

The highly nationalistic attitude of the Syrians damages the chances of private industry's securing a foreign loan. A recent law requiring all foreign operations to have Syrian managers and at least 50 per cent Syrian capital, together with the questionable security, makes sizable foreign investments unlikely. Under these conditions any foreign loans probably will be made to the government. The Syrian Government has made an obvious point of not obligating itself to another foreign power, and it is unlikely it will accept

758 743 ties are inadequate, especially in the rural areas. Up to 1949 there were only 2 small tuberculosis hospitals in the entire country 653 743 —near Damascus and near Aleppo. The development of increased medical facilities has recently been undertaken by the Ministry, and, in 1951, additions to the hospital near Damascus, to provide a total of 350 beds, and a new 300-bed hospital at Aleppo were under construction. Plans were also projected for the erection of a 500-bed hospital in Latakia province, which would bring the total number of beds available for the isolation and the treatment of tuberculous patients to between 1,000 and 1,200.

758 874 A tuberculosis demonstration and training center was established in Damascus in 1952 under the direction of the World Health Organization in collaboration with the Ministry and the Syrian University. It provides a regional headquarters for the training of doctors, nurses and social workers in the public health, the therapeutic and the social aspects of the disease.

164 751 361 **Smallpox.** Vaccination against smallpox is compulsory, but enforcement is necessarily incomplete in the more remote areas and among the nomadic tribes. Outbreaks occur from time to time, with sporadic cases reported almost annually in the intervening 164 years. The disease was epidemic in Syria and Lebanon in 1933-34, but from 1935 to 1941 only occasional cases were observed. In 1941, smallpox spread to Syria from Iraq, where an epidemic focus had developed in 1940. Over 1,980 cases were recorded in 1942 and 1,132 in 1943. The outbreaks subsided in 1944, and again no more than sporadic cases were noted until 1948, when 894 cases were reported. The known incidence declined to 643 cases in 1949 and subsequently to 15 cases in 1950-51.

Other Infections. Pneumonia and influenza are prevalent. Epidemics of measles are frequent, with the peak of prevalence 165 normally between January and May. The 164 majority of cases are not seen by the medi- 361 cal officers, but, from the fragmentary data available, the fatality rates appear to aver-

67: United Nations S-5 (1945-1954) 1955 M1 Middle East
SYRIA MD1

Chapter 7

SYRIA

Developments to the End of the Second World War

433

Until the end of the nineteenth century, the Syrian economy rested on agriculture, handicrafts and commerce. Then, as now, most of the land was planted to wheat and barley, whose yield was low, owing to the primitive methods employed and the inadequacy of the rainfall, but whose output usually left a small export surplus. Cultivation of fruits and tobacco was more intensive, and an appreciable amount was exported. Syrian handicrafts, such as cotton, silk and wool weaving, leather tanning and soap making, enjoyed a high reputation and supplied the Egyptian, Anatolian, Mesopotamian, North Arabian and Palestinian markets, as well as most of Syria and Lebanon. Commerce was a leading activity, Syria being the distributing centre for most of Arab Asia as well as southern Anatolia. 1/

In the course of the late nineteenth and early twentieth centuries some important changes took place. Owing to greater security, the margin of cultivation shifted eastwards and the sown area expanded. Handicrafts, on the other hand, began to decline owing to the competition of foreign machine-made goods. This decline was, however, more than offset by the rapid growth of commerce, which was stimulated by the building of railways and ports by foreign capital.

The First World War was a period of intense disorganization. Mobilization reduced manpower in agriculture, and the handicrafts and commerce were paralysed by the loss of supplies and markets. In the post-war years, the handicrafts declined rapidly, owing to a shift in taste to foreign goods, a general decline in purchasing power and intensified competition of foreign goods, against which the tariff gave little protection. Commerce was crippled by the breakup of the Ottoman Empire into several States with different tariffs, currencies and economic policies. Agriculture was handicapped by the very unsettled conditions prevailing until 1927, after which it was affected by the world depression; at the outbreak of the Second World War the area planted to cereals was not appreciably greater than it had been before the First World War.

433
653

Nevertheless, in this period, part of the groundwork of future progress was laid. Communications were improved by the construction of a good network of roads and by the building or enlarging of ports. Some irrigation schemes were carried out. Property rights in land were settled over a large area, thus removing a major obstacle to development.

1/ The French High Commission's report, La Syrie et le Liban en 1922, stated that until the First World War "Syria lived on its trade; it has lived almost exclusively on it; it has lived on it for many centuries" (quoted in S.B. Himadeh (editor), The Economic Organization of Syria (Beirut, 1936) page 119).